

REMARKS

In the Office Action of April 14, 2004, claims 1-4, 14-18, 21-26 and 102 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,872,888 (hereinafter referred to as Ehrfeld). In addition, claims 5 and 27-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ehrfeld as applied to claim 1 and further in view of U.S. Patent No. 5,753,014 (hereinafter referred to as Van Rijn). Finally, claims 19-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ehrfeld as applied to claim 1 and further in view of U.S. Patent No. 5,807,406 (hereinafter referred to as Brauker). Each of these rejections will be discussed in turn.

INDEPENDENT CLAIM 1 IS NOT ANTICIPATED OR MADE OBVIOUS BY EHRFELD

First, it is respectfully submitted that Ehrfeld does not disclose a polymeric membrane as required by claim 1. Ehrfeld simply states that "The molding substance used to fill the mold is a substance whose solubility, after solidification, changes under the influence of high-energy, e.g. X-ray, radiation." (See col. 3, lines 51-54) The material identified by the Examiner in the Office Action, polymethyl methacrylate (PMMA), is the material used to form the "mold." (See col. 4, lines 34-40). Ehrfeld does not disclose the material used to form the filter, and it is respectfully submitted that it is unlikely that it would be the same material used in creating the "mold." This is

further indicated by the fact that when the specification refers to the material poured into the mold, it makes no reference to PMMA, which is identified as a possible material used to create the "mold." (See col. 4, lines 34-40).

In addition, independent claim 1 requires a polymeric filter membrane with a filter layer and a support layer that are "monolithic." The term, "monolithic," is consistently defined as including either (1) a membrane in which the filter and support are made from a single sheet of film or (2) a membrane in which the filter and support begin in different films that are cured together to chemically bond, or cross-link, to form a single structure without a discernible line of distinction between the filter layer and support layer. Ehrfeld does not describe, teach, or suggest this "monolithic" configuration that could include either of the foregoing.

Ehrfeld is directed to a process for creating filters by injection-molding or casting the filter. (See col. 1, lines 49-50). Specifically, the first five figures demonstrate how the mold (41) is formed and positioned. (See col. 2, lines 43-56). The resulting mold (41) (made by the process demonstrated in Figures 1-4) is shown in Figure 5. A cover plate (51) is placed over the mold (41), and the resulting mold is filled with a molding mass through casting bores (52). (See col. 3, lines 47-50).

In contrast to the molding or casting method employed by Ehrfeld, the "monolithic" membrane structure, as required by the claims and defined in the specification of the present

application, may include filter and support structures that may be made from a single sheet of film or begin in different films that are cured together to form a single structure without a discernible line of distinction between them -- which is not suggested in Ehrfeld and, indeed, could not be fashioned from the Ehrfeld process.

For these reasons, it is respectfully requested that the pending claim 1 be reconsidered and allowed.

THE DEPENDENT CLAIMS ARE NOT ANTICIPATED OR OBVIOUS

The pending dependent claims incorporate all the features and limitations of claim 1 and are allowable for at least the reasons set forth above. In addition, the dependent claims include further features or limitations.

For example, dependent claim 5 incorporates the features and limitations of claim 1 and further requires that the support layer include at least two sublayers of differing porosity. It is respectfully submitted that claim 5 is not obvious in view of Ehrfeld and Van Rijn because neither teaches or suggests a "monolithic" filter membrane as required by the claim. In addition, it is respectfully submitted that it is illogical to combine Ehrfeld with Van Rijn because neither suggests, teaches, or describes the desirability or the benefits of combining the features of one with the other.

The Examiner relies on Ehrfeld to show a "monolithic" structure. As demonstrated above, Ehrfeld does not disclose a "monolithic" polymeric filter as required by claims 1 and 5. In

the Office Action of August 24, 2001, the Examiner recognized that Van Rijn does not teach a "monolithic" filter membrane. Therefore, it is respectfully submitted that the references do not, even if combined, result in the claimed "monolithic" filter. Moreover it is illogical to combine Ehrfeld and Van Rijn. The two patents describe apparently disparate materials and incompatible technologies.

Van Rijn describes a vapor deposition and etching process used to create filters. (See col. 11, line 22 - col. 12, line 38). This process is inapposite to the casting or injection-molding process used in Ehrfeld, except as it may possibly be used to form the "mold" of Ehrfeld. Van Rijn actually states that the process it uses to create filters could also be used to create a mold similar to the one portrayed in Ehrfeld. ("A mould processed with use of silicon micromachining according to the invention for the imprinting of a pattern in a pattern forming layer may also be used for direct perforating... or may be used as a mould for injection moulding or hot embossing of a very thin filtration membrane. See col. 13, lines 48-53). In this regard, Van Rijn clearly did not contemplate the "monolithic" filter of the present invention -- and the only logical combination of Van Rijn and Ehrfeld concerns how to make a mold and not how to make a filter membrane. Consequently, it is respectfully submitted that it would be inappropriate to combine Van Rijn with Ehrfeld to form the basis of an obviousness rejection.

Finally, neither Van Rijn nor Ehrfeld present a rationale for combining the features of the other to arrive at the

benefits of the presently claimed invention. Ehrfeld does not teach, suggest, or describe the benefits of a multilayered approach. Ehrfeld does not teach, suggest, or describe the benefits of using polymeric sheets of films. In addition, Van Rijn employs a very different technological approach to making a filter membrane, than described in Ehrfeld.

Turning to claims 27-30, they include all the features of claim 1 and further specify a specific pore size and/or specify a specific pore shape not described in the cited references. For the reasons stated above, it is respectfully submitted that it is illogical to combine Ehrfeld and Van Rijn and that the claimed subject matter would not have been obvious in view of Ehrfeld and Van Rijn.

Finally, with respect to claims 19-20, it is submitted that Brauker is not within the field of the present invention. Although both the present invention and Brauker technically concern membranes, the term "membrane" refers to many different devices, and that not all membranes are filter membranes as described in the present claims.

Brauker is specifically directed to tissue growth structures that are implanted to promote a biological response by the formation of vascular structures near the host tissue interface. (See col. 2, line 25). No liquid or other material passes through the structure -- there is no filtration form, function, or feature disclosed in Brauker. Therefore, the field of endeavor which encompasses Brauker is the field of implanting materials into body tissue and, in a more specific sense,

implanting materials that have a therapeutic effect. (See col. 1, lines 5-11).

In contrast, the field of the present invention in a general sense is the field of microporous filter membranes, and in a more relevant sense, is the field of polymeric microporous filter membranes of the type employing a filter layer with micron-scaled precision-shaped pores and precision shaped support structure. The present invention is a filter, whereas Brauker describes an implantable lattice structure that is designed to promote the growth of living cells.

There is no suggestion or teaching that would lead one of ordinary skill to consider Brauker or to combine it with Ehrfeld to address the objectives of the present invention. The problem faced in Brauker is not pertinent to the problems the present invention solves and is not combinable to render claims 19-20 obvious.

For these reasons, it is respectfully submitted that claims 19-20 are allowable.

Other dependent claims add further features not shown or suggested in the cited references. Claim 14, for example, is dependent from claim 1 and is directed toward a filter membrane in which the filter and support layers are comprised of different materials that are sufficiently compatible to form a "monolithic" membrane.

Claim 16 is also dependent from claim 1 and recites structure for a filter membrane in which the filter layers are

formed separately of the same material and joined together later to form "monolithic" layers.

Claim 21 is dependent from claim 1 and recites structure for a filter in which the filter membrane is flexible. Furthermore, Claim 22 is dependent from claim 21 and is directed toward a filter membrane that is sufficiently flexible to be disposed along a radius of curvature of at least one-half inch.

Claim 28 is dependent from claim 1 and recites structure of a filter membrane in which the said micron-scale precision shaped pores are non-circular. In addition, claim 30, which is dependent from claim 28, recites a structure of a filter in which the pores are sized and shaped to prevent the passage of human white blood cells and permit the passage of red cells and platelets.

It is respectfully submitted that these features are not shown or suggested by the cited references.

CONCLUSION

For the reasons stated above, it is respectfully requested that the pending claims 1-5, 14-30 and 102 be reconsidered and allowed.

Respectfully submitted,

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